

86745

S/120/60/000/006/020/045

E032/E314

Apparatus for the Observation of E.P.R. Spectra of Solids
During Their Irradiation by Fast Electrons

order of 1 or 2 mm. The entire apparatus is placed in a special enclosure which screens it from X-rays. In the region in which the radiation strikes the specimen, there is only the magnet, the resonator and the high-frequency field modulator. The constant magnetic field and the modulation fields are adjusted by remote control. The power is introduced into the resonator through rectangular waveguides having a total length of about 25 m. These had practically no effect on the sensitivity and stability of the spectrometer. The electron-beam current was monitored by an ionisation chamber (5 in Fig. 1) which was placed above the specimen 8. Additional magnets were provided for controlling the beam. The ionisation chamber was in the form of two foils, each 5 μ thick, and separated by a gap of 5 mm. Ions produced in the gap between the foils are extracted by an electric field derived from a storage battery of 160 V. The dose delivered to the specimen was determined from the formula:

$$D = AIt$$

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where I is the electron current in μA at the beam shutter
4 (Fig. 1),

t is the time of irradiation and

A is a constant for the given substance.

The latter constant is given by:

$$A = \frac{dE}{d\xi} n \frac{j}{I} :$$

where $dE/d\xi$ is the rate of loss of energy in the
irradiated specimen in eV/g/cm^2 ,

n is the number of electrons in $1 \mu\text{A}$ of beam
current,

j/I is the ratio of current densities at the beam
shutter and at the specimen.

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EO32/E314

Apparatus for the Observation of E.P.R. Spectra of Solids
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The constant A was determined in special experiments in which the specimen was replaced by special probes having the same dimensions as the specimen. In the measurements reported in the present paper the dose rate was varied between

3×10^6 and 3×10^3 rad/sec. The temperature of the specimen was varied by blowing a stream of nitrogen from a dewar filled with liquid nitrogen. In this way, any temperature between -150 and +150 °C can be obtained to within ± 1 °C. The specimens were in the form of discs 3 or 5 mm in diameter and 2 mm thick. The discs were placed in the resonator at the end of a thermocouple. Acknowledgments are expressed to V.V. Voyevodskiy for his interest in the present work. There are 7 figures and 7 references: 6 Soviet and 1 English.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR
(Institute of Chemical Physics of the AS USSR)

SUBMITTED: November 12, 1959

Card 5/5

67899

5.3100
5.4500(B)

5(4)
AUTHORS:

Chkheidze, I. I., Molin, Yu. N.,
Buben, N. Ya., Voevodskiy, V. V.,

S/020/60/130/06/031/059
B004/B007
Corresponding Member AS USSR

TITLE:

The E.P.R.-Spectra[✓] and the Kinetics of the Accumulations of
Radicals[✓] in the Radiolysis of Some Aromatic Compounds

PERIODICAL:

Doklady Akademii nauk SSSR, 1960, Vol 130, Nr 6, pp 1291 - 1293
(USSR)

ABSTRACT:

It was the aim of the present paper to determine the nature of the radicals formed in the radiolytical decomposition of aromatic hydrocarbons, as well as to investigate the influence exerted by structure upon the yield of radicals. The electron paramagnetic resonance (e.p.r.) - spectra of the radicals were recorded which are formed under the influence of fast electrons (1.6 Mev), and the kinetics of their accumulation was measured. Irradiation was carried out at -124 and at +33°. Chemically pure benzene[✓] was used. The other compounds: diphenyl, p-ditolyl, o-ditolyl, m-terphenyl, and p-terphenyl were supplied by the laboratory of K. P. Lavrovskiy of the Institut neftekhimicheskogo sinteza (Institute of Petroleum-chemical Synthesis). Figure 1 shows the e.p.r. spectra at -124°. The e.p.r. spectrum

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The effects of ...

S/844/62/000/000/093/129
D204/D307

believed to contain sufficient kinetic energy to enter into reaction with a nearby $-CH_2-$ group of PE, to form HCl and an alkyl radical.

The radiolysis products of benzene are thought to be \dot{C}_6H_5 and $C_6H_6^-$.

The advice of Yu. N. Molin and I. I. Chkheydze is acknowledged. There are 6 figures.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics, AS USSR)

Card 3/3

42651

S/062/62/000/011/016/021
B117/B101

11. 1510
AUTHORS:

Avramenko, L. I., Buben, N. Ya., Kolesnikova, R. V.,
Tolkachev, V. A., and Chkheidze, I. I.

TITLE:

EPR study of radicals formed by hydrogen atoms reacting with
benzene

PERIODICAL:

Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh
nauk, no. 11, 1962, 2079-2081

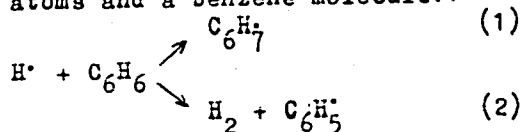
TEXT: The authors analyzed the epr spectra of free radicals formed by
hydrogen atoms reacting with benzene in the gas phase at 20 and 200°C and
frozen out with liquid nitrogen. Experimental conditions: silent
discharge (6000 v, 150 ma), benzene concentration, $\sim 6 \cdot 10^{14}$ molecules .
per cm^3 ; hydrogen pressure, 14-15 mm Hg; linear flow rate, 160 cm/sec;
duration, 12-18 min. The epr spectrum of the radicals formed at 200°C
by the reaction $\text{H} \cdot + \text{C}_6\text{H}_6$ is a triplet with a total splitting of 93 ± 5 oe.
In addition each component of the triplet is split into four lines at a
distance of 10 ± 1 oe. This spectrum was identified as the spectrum of

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S/062/62/000/011/016/021
B117/B101

EPR study of radicals formed...

the $C_6H_7^{\cdot}$ radical. When the reaction temperature is raised up to $200^{\circ}C$, not only the $C_6H_7^{\cdot}$ radical is formed, but also radicals of another type - obviously $C_6H_5^{\cdot}$ - which show a singlet. Their relative amount increases as the temperature is raised. Hence the two primary reactions may occur between hydrogen atoms and a benzene molecule::



it is assumed that at room temperature reaction (1) mainly occurs and at higher temperatures reaction (2) takes place. The weak lines detected on the edges of all spectra were attributed to the background, of which the spectrum analysis took no account and which therefore requires a separate investigation. There are 2 figures.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

SUBMITTED: June 15, 1962
Card 2/2

35062

S/195/62/G03/001/003/010

E071/E136

11.15.10

AUTHORS: Yermolayev, V.K., Molin, Yu.N., and Buben, V.Ya.
TITLE: Recombination of radicals in solid organic substances.
I. Investigation by the method of fusion
PERIODICAL: Kinetika i kataliz, v.3, no.1, 1962, 58-64

TEXT: The range of temperatures at which recombination of radicals takes place on fusion of various organic substances, irradiated with fast electrons, was studied by the ЭПР (EPR) method. The object of this work was to determine the molecular movements leading to the recombination of radicals in a solid. For this reason the substances investigated had a known phase behaviour on heating. Normal alcohols, ketones, hydrocarbons, aromatic compounds etc. were investigated. To determine the stability of radicals at various temperatures, fusion curves were obtained. For this purpose a substance was irradiated at a sufficiently low temperature T_0 in a stream of fast electrons to obtain a concentration n_0 of radicals. The irradiation was stopped at the beginning of the linear part of the curve of accumulation of radicals ($n_0 \approx 10^{19}$ radicals/g).

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X

Recombination of radicals in solid ... S/195/62/003/001/003/010
E071/E136

The temperature T_0 was so chosen that during 10-15 minutes no noticeable decrease in the concentration of radicals occurred. The substance was then heated for 2 minutes at a temperature $T_1 > T_0$, cooled to T_0 and the concentration of radicals n_1 measured etc. The dependence $n_i(T_i)$ was called the fusion curve. It was established that for crystalline substances (substances of type I) a rapid recombination of radicals occurs, as a rule, before melting; for amorphous substances the process takes place near the divitrification temperature. For cyclopentane and cyclohexene (type II), radicals recombine near the temperature of their polymorphic transformation. For hexamethylbenzene, acetone, succinic acid (type III) several ranges of recombination of radicals can be separated. In the majority of cases the recombination of radicals is, apparently, caused by self diffusion, appearing close to the temperature of a phase change. For substances of type III the recombination of radicals takes place at a temperature at which the self diffusion of molecules is apparently absent, e.g. in hexamethylbenzene and acetone, radicals recombine partially in the region at which

Card 2/3

Recombination of radicals in solid ... S/195/62/003/001/003/010
EO71/E156

the molecules begin to rotate. The recombination of radicals in the absence of self diffusion could be explained by the formation of radicals close to each other, e.g. on the neighbouring molecules in pairs. Then initiation of any molecular movement may lead to their recombination. However, the formation of radicals on neighbouring molecules should be accompanied by a strong widening of components of the superfine structure of the EPR spectra, much higher than was actually observed.

The authors thank V.V. Voyevodskiy and G.K. Voronova for their assistance. Part of the material of the present paper was presented at the Second All-Union Conference on Radiation Chemistry. There are 5 figures.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR
(Institute of Chemical Physics, AS USSR)
Institut khimicheskoy kinetiki i goreniya SO AN SSSR
(Institute of Chemical Kinetics and Combustion
SO AS USSR)

Card 3/3

SUBMITTED: August 14, 1961

X

h2168

S/195/62/003/005/002/007
E075/E436

11.9200 (also 4223)
11.5132

AUTHORS: Molin, Yu.N., Chkheidze, I.I., Kaplan, Ye.P.,
Buben, N.Ya., Voyevodskiy, V.V.

TITLE: Formation of radicals during radiolysis of solid
organic materials. Part I. Comparison of radical
yields in various organic compounds

PERIODICAL: Kinetika i kataliz, v.3, no.5, 1962, 674-679

TEXT: The work was carried out to establish a connection
between molecular structure and probability of its dissociation
into radicals under the action of high energy radiation.
A series of naphthenic and hydroaromatic hydrocarbons with
non-conjugated unsaturated bonds were investigated as well as
some aromatic compounds (di- and triphenyls and phenyl ethers).
The purity of the compounds was 95 to 99%. The solids were
irradiated with fast electrons, the dosage varying between 0.02
and 1 Mrads/sec. Maximum dosage reached 30 Mrads. The yields
of free radicals were determined by electron paramagnetic
resonance at -170 to -110°C using the initial linear part of the
curves relating the numbers of radicals formed to time of
Card 1/3

Formation of radicals ...

S/195/62/003/005/002/007
E075/E436

irradiation. It was found that for naphthenic and hydroaromatic hydrocarbons the yields amounted to several radicals per 100 eV of absorbed energy. A large yield was also obtained for n-hexadecene-1. Thus the unsaturated bonds in these compounds do not inhibit the radical formation. This conclusion does not agree with that obtained by A. Charlesby and M.G.Ormerod (V. Intern. Symp. on Free Radicals, Uppsala, 1961, paper 11). For the aromatic compounds the yields are smaller by 1 to 2 orders of magnitude. The yields decrease with the increasing number of conjugated double bonds in aromatic molecules and with the increasing degree of substitution of benzene rings with groups containing unshared electron pairs or multiple bonds conjugated with the aromatic system of the molecule. It is concluded that the yield of radicals G_R decreases with the decreasing first excitation energy level E_1 . Especially marked changes in the yield are observed when $E_1 \approx DCH$, where DCH is the energy of rupture of a C-H bond. There are 1 figure and 2 tables.

ASSOCIATIONS: Institut khimicheskoy fiziki AN SSSR
(Institute of Chemical Physics AS USSR)

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Formation of radicals ...

8/195/62/005/002/007
E075/E436

Institut khimicheskoy kinetiki i goreniya
SO AN SSSR (Institute of Chemical Kinetics and
Combustion SO AS USSR)
Institut organicheskoy khimii AN SSSR
(Institute of Organic Chemistry AS USSR)

SUBMITTED: May 9, 1962

Card 3/3

TOLKACHEV, V.A.; CHKHEIDZE, I.I.; BUHEN, N.Ya.

Electron paramagnetic resonance spectra of phenyl radicals.
Zhur.strukt.khim. 3 no.6:709-711 '62. (MIRA 15:12)

1. Institut khimicheskoy fiziki AN SSSR.
(Benzene—Spectra)
(Radicals (Chemistry)—Spectra)

MOLIN, Yu.N.; KORITSKIY, A.T.; SHAMSHEV, V.N.; BUBEN, N.Ya.

Temperature changes in the electron paramagnetic resonance spectra of allyl and some other radicals in irradiated polymers. Vysokom. soed. 4 no.5:690-695 My '62. (MIRA 15:7)

1. Institut khimicheskoy fiziki AN SSSR i Institut khimicheskoy kinetiki i gorennya Sibirskogo otdeleniya AN SSSR.
(Polymers) (Radiation) (Radicals (Chemistry)--Spectra)

38294

S/190/62/004/006/022/026
B101/B110

15.2530
AUTHORS:

Nikol'skiy, V. G., Buben, N. Ya.

TITLE:

Radiothermoluminescence of organic compounds. II

PERIODICAL:

Vysokomolekulyarnyye soyedineniya, v. 4, no. 6, 1962,
922-925

TEXT: In order to relate the position of the maximum on the thermoluminescence curve with the temperatures of the phase transitions, high-density polyethylene, paraffin, butadiene rubbers, teflon, and polyisobutylene were irradiated with fast electrons at 77°K by a method already described (Dokl. AN SSSR, 134, 134, 1960). Results: (1) Preliminary irradiation (10^6 - 10^8 rad), heating to room temperature (cessation of luminescence), recooling to 100°K, and re-irradiation with $5 \cdot 10^5$ rad resulted in a shift of the maximum temperature, T_m , on the luminescence curve toward higher temperatures in the case of polyethylene, paraffin, and butadiene rubbers. Irradiation with doses $> 5 \cdot 10^7$ rad did not change T_m any more. With teflon, T_m remained unchanged; with polyisobutylene, it shifted toward lower temperatures. Thus the change of T_m reflects the

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Radiothermoluminescence of ...

S/190/62/004/006/022/026
B101/B110

structural changes of polymers caused by irradiation: with cross linking, T_m increases, with degradation, it remains unchanged or drops. This was also observed with thermally degraded (150-300°C) polyisobutylene and polyethylene. (2) Cold stretching, too, increased T_m of polyethylene by 10-12°C. (3) The dependence of T_m on the heating rate ω (deg/sec) follows the equation $1/T_m = c_1 - c_2 \log \omega$. For the constants $c_1 \cdot 10^3 \text{ deg}^{-1}$ and $c_2 \cdot 10^5 \text{ deg}^{-1}$, the following values were found: paraffin 4.38, 35; polyethylene 4.275, 15.5; polyethylene crosslinked by 10^2 Mrad, 4.18, 12.7, respectively. The activation energy extrapolated to 0°K (kcal/mole) for these three substances was 13 ± 1.5 ; 29 ± 2 ; 36 ± 2 , respectively. There are 2 figures and 1 table.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics AS USSR)

SUBMITTED: March 19, 1961

Card 2/2

32820

S/020/62/142/001/019/021
B145/B101

5.4600

11.1510

AUTHORS: Koritskiy, A. T., Shamshev, V. N., and Buben, N. Ya.

TITLE: Energy transfer in radiolysis of toluene with admixtures

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 142, no. 1, 1962, 120-122

TEXT: The effect of small admixtures of CCl_4 , benzoyl peroxide, and CS_2 on radiation yields of radicals obtained when irradiating frozen toluene, and on the epr spectrum was studied by measuring the electron paramagnetic resonance (epr). When toluene containing the dissolved admixtures was cooled rapidly, it was obtained in an amorphous form. The arrangement of the apparatus and the method of determining the yields of free radicals had been described before (Yu. M. Molin, A. T. Koritskiy, A. D. Semenov et al., Pribory i tekhn. eksperiment., no. 6 (1960); A. T. Koritskiy, Yu. N. Molin et al., Vysokomolek. soyed., 1, 1182 (1959)). An increase of the initial yield, G, of radicals by 4 to 5 times was observed with a CCl_4 molar part of $5 \cdot 10^{-4}$ at -160°C . The shape of the epr spectrum corresponds to a superposition of spectra of the $\dot{\text{C}}\text{Cl}_3$ and $\dot{\text{C}}_6\text{H}_4\text{-CH}_3$ radicals. With a

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B145/B101

Energy transfer in radiolysis ...

molar part of $5 \cdot 10^{-4}$ of benzoyl peroxide or of 10^{-2} of CS_2 , G was increased by 3 and 5 to 6 times, respectively. The spectra of the radicals formed from CS_2 added to toluene are asymmetric and rather complex. Therefore, it has not yet been possible to identify the radicals. When using crystalline toluene, no increase in yield due to admixtures could be observed. Apparently, an energy transfer to the molecules of the substance added, or to complexes between the two types of molecules takes place. A considerable part of the resulting radicals originated from the molecules of the admixture and from the neighboring toluene molecules. There are 2 figures and 14 references: 10 Soviet and 4 non-Soviet. The four references to English-language publications read as follows: S. Lipsky, M. Burton, J. Chem. Phys., 31, no. 5, 1221 (1959); Nottingham discussion on energy transfer, apr. 1959, Disc. Farad. Soc., no. 27 (1959); S. Okamura, M. Tomonobu, Memoirs of the Faculty of Engineering Kyoto University, 21, 3, 294 (1959); J. P. Manion, M. Burton, J. Phys. Chem. 56, 560 (1952).

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

PRESENTED:

July 24, 1961, by V. N. Kondrat'yev, Academician

SUBMITTED:

July 18, 1961

Card 2/2

TOLKACHEV, V.A.; CHEKHEIDZE, I.I.; BUBEN, N.Ya.

Electron paramagnetic resonance spectrum of benzyl radicals.
Dokl. AN SSSR 147 no.3:643-644 N '62. (MIRA 15:12)

1. Institut khimicheskoy fiziki AN SSSR. Predstavleno akademikom
V.N. Kondrat'yevym.
(Toluene) (Radicals (Chemistry)—Spectra)

S/020/62/147/006/030/034
B144/B186

15.500
15.620

AUTHORS: Nikol'skiy, V. G., Buben, N. Ya.

TITLE: Plastification of polyethylene in low-temperature radiolysis

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 147, no. 6, 1962, 1406-1408

TEXT: The temperature effect on the structural changes in irradiated polyethylene was evaluated from the luminescence curve recorded with a photomultiplier. High-pressure polyethylene was irradiated at 77°K with fast electrons (1 - 70 Mrad) and then heated at a rate of 20°C/min to 300°K. It was found that increasing the irradiation dose shifted the maximum of luminescence toward lower temperatures. T_{max} , designating also the vitrification point of polyethylene, was reduced by $\sim 40^{\circ}\text{C}$ when the dose was raised from 1 to 70 Mrad. When irradiation with 20 Mrad was repeated using the same dose under otherwise equal conditions, T_{max} shifted slightly toward higher temperatures owing to crosslinking induced by the first irradiation (Vysokomolek. soyed., 4, no. 6 (1962)). T_{max} shifted toward lower temperatures if the second dose was higher than the first.
Card 1/2

Plastification of polyethylene in ...

S/020/62/147/006/030/034
B144/B186

These phenomena are due to plastification of the polymer by molecular hydrogen and light hydrocarbons which are produced in the radiolysis, but cannot diffuse at 77°K. The interdependence of diffusion rate and heating rate was proved by heating 60μ thick polyethylene samples, irradiated with 0.5 and 4 Mrad, at different rates. Whereas, at a heating rate of 40 - 50°C/min, the devitrification temperature of the samples irradiated with 4 Mrad was 4 - 6°C lower than that of the 0.5 Mrad samples, no difference was observed with a heating rate of 5°C/min. Thus with slow heating the plastifying radiolytic products were diffused before the vitrification point was reached. Thus crosslinking leads to a higher vitrification point, while plastification increases the molecular mobility and reduces the vitrification temperature. There are 2 figures.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

PRESENTED: July 19, 1962, by V. N. Kondrat'yev, Academician

SUBMITTED: July 16, 1962

Card 2/2

ACCESSION NR: AP3000135

S/0062/63/000/005/0954/0954

AUTHOR: Nikol'skiy, V. G.; Chkheidze, I. I.; Buben, N. Ya.

TITLE: Reaction of alkyl radicals with oxygen in solid phase

SOURCE: AN SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 5, 1963, 954

TOPIC TAGS: EPR-spectra, polyethylene, natural rubber, dicyclohexyl-4-decane

ABSTRACT: The authors studied the EPR spectra of samples of polyethylene, natural rubber, dicyclohexyl-4-decane, and some other amorphous organic compounds which were irradiated by fast electrons at 77K. When the temperature of the irradiated sample was raised, a formation of peroxide-type radicals was observed, which was due to the reaction of the alkyl radicals with the oxygen which was dissolved in the substance. In particular, in the case of the samples which were vitrified in air prior to irradiation, the stabilized alkyl radicals were oxidized completely if their concentration did not exceed 2×10^{17} to 1×10^{18} g sup -1. It was noted for all the compounds studied that the oxidation rate of the radicals sharply increases in the temperature interval from 80 to 50 degrees below the vitrification point. In the case of dicyclohexyl-4-decane (vitrification point

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ACCESSION NR: AP3000135

-195K), the oxidation rate of the radicals rises almost 1000 times when the temperature is changed from 120 to 140K. During oxidation, the summary concentration of the radicals in the samples undergoes no essential change. Rapid oxidation of the alkyl radicals during the heating of irradiated samples of polyethylene begins at Gamma-transition temperature, 150 to 155 K (releasing the mobility of the segments - CH sub 2 -). During the heating of hydrocarbons which had been irradiated in the crystalline state, an analogous oxidation of the radicals did not occur down to melting temperature. This is apparently associated with the fact that the equilibrium concentration of oxygen in the crystalline phase is much lower than in the amorphous state.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences SSSR)

SUBMITTED: 22Jan63

DATE ACQ: 12Jun63

ENCL: 00

SUB CODE: CH;PH

NO REF SOV: 000

OTHER: 000

Card 2/2

ACCESSION NR: AP3000136

8/0062/63/000/005/0955/0955

AUTHOR: Nikol'skiy, V. G.; Alfinov, M. V.; Buben, N. Ya.

TITLE: The nature of radio-thermoluminescence of organic compounds

SOURCE: AN SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 5, 1963, 955

TOPIC TAGS: radiolysis, radio-thermoluminescence, hexane, nonane, benzene, polyethylene, alkyl radicals, aromatic free radicals

ABSTRACT: When organic substances are heated, a glow is very often observed after radiolysis. This glow-radio-thermoluminescence is associated with the recombination of ions which were stabilized in the substance during radiolysis (Pannell, J. H., Manning, B.; Journ. Chem. Phys. 23, 1368, 1955), or with the recombination of stabilized radicals (Kustanovich, I. M., Polak, L. S., Rytova, N. M.; Proceedings of 2nd All-Union Conference on Radio Chemistry. Moscow. Izd. AN, SSSR, 1962, p. 322).

Samples of saturated and aromatic hydrocarbons (hexane, nonane, benzene, and others) which were irradiated by fast electrons at 77K were studied. It was found that all of these substances luminesce if they are excited by visible light at 77K after radiolysis. During a prolonged exposure, the intensity of the

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ACCESSION NR: AP3000136

photoluminescence gradually drops and can be reduced by approximately 100 times. The test samples then whiten and the color acquired during radiolysis disappears. During subsequent thawing, the whitened test samples have a gleam which is many times weaker than that of samples which were not subjected to light. It was shown that the concentration of radicals in the sample (according to EPR data) during exposure does not substantially change. Test samples of polyethylene, subjected to mechanical decomposition at 100K and consequently containing approximately 10^{19} radicals per gram, were also studied. The findings indicate that radio-thermo-luminescence of organic compounds is not associated with the evolution of energy during recombination of alkyl or aromatic free radicals. The coloring of organic samples during radiolysis, which is characteristic for them from photo- and thermo-luminescence, are primarily determined by the processes of stabilization and re-combination of charges.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences SSSR).

SUBMITTED: 16Feb63

DATE ACQ: 12Jun63

ENCL: 00

SUB CODE: CH,PH

NO REF SOV: 001

OTHER: 001

Card 2/2

L 12716-63

EWP(j)/EPF(c)/EWT(m)/BDS AFFTC/ASD Pc-4/Pr-4 RM/JFW/WW

ACCESSION NR: AP3002302

S/0062/63/000/006/1143/1144

AUTHOR: Buben, N. Ya.; Tolkachev, V. A.; Chkheidze, I. I.

TITLE: Peculiarities in the ¹⁹radiolysis of phenol and benzyl chloride

SOURCE: AN SSSR. Izv. Otdeleniye khimicheskikh nauk, no 6, 1963, 1143-1144

TOPIC TAGS: radiolysis, phenol, benzyl chloride, electron paramagnetic resonance, hydroquinone, phenoxy, phenyl radicals, benzyl

ABSTRACT: Electron paramagnetic resonance studies showed that whereas in the radiolysis of a series of aromatic compounds radicals of the cyclohexadienyl type are formed, irradiation of phenol, hydroquinone, and benzyl chloride does not give rise to such radicals. EPR spectra showed that irradiated phenol contained phenoxy and phenyl radicals, and benzyl chloride, benzyl and benzyl chloride radicals. The mechanism of radiolysis of these compounds must differ from that of alkyl benzenes and, for phenol, involve cleavage of O-H and C-OH bonds.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences SSSR)

SUBMITTED: 06 Mar 63

DATE ACQ: 16 Jul 63

ENCL: 00

SUB CODE: 00

NO REF SOV: 002

OTHER: 001

Card 1/1

ALFIMOV, M.V.; BUBEN, N.Ya.; PRISTUPA, A.I.; SHAMSHEV, V.N.

Excitation of triplet states of naphthalene and benzene molecules
by fast electrons. Izv.AN SSSR.Ser.khim. no.8:1525 Ag '63.
(MIRA 16:9)

1. Institut khimicheskoy fiziki AN SSSR.
(Naphthalene--Spectra) (Benzene--Spectra)

MOLIN, Yu.N.; CHKEIDZE, I.I.; KAPLAN, Ye.P.; BUBEN, N.Ya.; VOYE-
VODSKIY, V.V.

Formation of radicals in the radiolysis of solid organic
substances. Part 2: Yield of radicals in benzene and biphenyl
derivatives. Kin. i kat. 4 no.4:557-560 JI-Ag '63. (MIRA 16:11)

1. Institut khimicheskoy fiziki AN SSSR, Institut khimicheskoy
organicheskoy khimii AN SSSR.

BUBEN, N.Ya.; TOLKACHEV, V.A.; CHKHEIDZE, I.I.

Radicals formed in low-temperature radiolysis of toluene. Kin.i
kat. 4 no.5:683-687 S-O '63. (MIRA 16:12)

1. Institut khimicheskoy fiziki AN SSSR.

S/190/63/005/004/015/020
B101/B220

AUTHORS: Slovkhotova, N. A., Koritskiy, A. T., Kargin, V. A.,
Buben, N. Ya., Bibikov, V. V., Il'icheva, Z. F.,
Rudnaya, G. V.

TITLE: Effect of fast electrons on polyethylene at low temperatures.
I. Double bonds in irradiated polyethylene

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 5, no. 4, 1963, 568-574

TEXT: High-density polyethylene (PE), low-density PE, and PE obtained by radiation polymerization, were irradiated with 1.6 Mev electrons in liquid or gaseous N₂. The dose was varied from 25 to 300 Mrad. The IR spectra were studied from -196 to +50°C. The intensity of the 966 cm⁻¹ band proved to be independent of the nature of the PE and of the temperature. Hence it is concluded that the trans-vinylene bonds form in the primary irradiation act. On the contrary, the 909 cm⁻¹ band characteristic of vinyl bonds was with 200 Mrad and at -196°C six times as large and at -50°C only 2.5 times as large as in nonirradiated PE. With doses below 25 Mrad the initial concentration of vinyl groups decreased, whereas with

Card 1/2

Effect of fast electrons on....

S/190/63/005/004/015/020
B101/B220

higher doses it increased. Thus irradiation induces the formation as well as the disappearance of vinyl double bonds, the disappearance being favored by higher temperatures. From the experimental fact that the N_{tv}/N_v ratio of the trans-vinylene to the vinyl groups is 18 for PE obtained by radiation polymerization, but 14 with high-density PE, it is assumed that the most probable process is a migration of energy and the formation of vinyl groups by the H atoms splitting off from two neighboring C atoms at the end of the molecular chain. There are 3 figures and 1 table.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physico-chemical Institute imeni L. Ya. Karpov)

SUBMITTED: October 11, 1961

Card 2/2

S/190/63/005/004/016/020
B101/B220

AUTHORS: Slovozhotova, N. A., Koritskiy, A. T., Kargin, V. A.,
Buben, N. Ya., Il'icheva, Z. F.

TITLE: Effect of fast electrons on polyethylene at low temperatures.
II. Conjugated double bonds and allyl radicals in irradiated
polyethylene

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 5, no. 4, 1963, 575-580

TEXT: The IR and epr spectra of irradiated polyethylene were studied.
Results: (1) Irradiation with more than 50 Mrad induces the formation of
conjugated double bonds which are characterized by the 985 cm^{-1} band.
(2) At low temperatures allyl groups form which are characterized by the
 944 cm^{-1} band detected also in the epr spectrum. (3) When benzene or
toluene were admixed to the polyethylene the yield in allyl radicals and
conjugated bonds was reduced. A protective action of the benzene ring
owing to charge migration is assumed. There are 4 figures.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physico-
chemical Institute imeni L. Ya. Karpov)

~~Case 1/2~~

L 19165-63

EWP(j)/EPF(c)/EWT(1)/EWT(m)/BDS . AFFTC/ASD/IJP(C)/SSD

Pc-4/Pr-4 RM/WW/MAY

ACCESSION NR: AP3005334

S/0181/63/005/008/2248/2256

AUTHORS: Nikol'skiy, V. G.; Tochin, V. A.; Buben, N. Ya.

TITLE: Stabilization of electrons during low-temperature radiolysis of organic substances

SOURCE: Fizika tverdogo tela, v. 5, no. 8, 1963, 2248-2256

TOPIC TAGS: electron, stabilization, low temperature, radiolysis, organic substance, trap, photoluminescence, spectrum, excitation, saturated hydrocarbon, alkyl radical, polyethylene, absorption spectrum, conduction band, thermoluminescence

ABSTRACT: The authors have investigated the spectrum of photoluminescence excitation for several saturated hydrocarbons exposed to fast electrons at a temperature of 77K. In irradiated samples of polyethylene they also studied absorption spectra at low temperatures and plotted the dependence of the absorption coefficient on the dose of radiation. The results obtained indicate that (in samples of saturated hydrocarbons) centers of localization are formed during

Card 1/2

L 19165-63

ACCESSION NR: AP3005334

2

low-temperature radiolysis, with energy levels at 2-3 ev below the conduction band. It is concluded that deep electron traps are formed in saturated hydrocarbons during low-temperature radiolysis, the traps apparently being stabilized alkyl radicals. The dominant stabilization of electrons in alkyl radicals takes place during incipient radiolysis, at doses of 10^5 - 10^6 rads. Thermoluminescence of organic compounds cannot be explained by the assumption of thermal ejection of electrons from traps. Orig. art. has: 7 figures.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR, Moscow (Institute of Chemical Physics, Academy of Sciences, SSSR)

SUBMITTED: 25Mar63

DATE ACQ: 06Sep63

ENCL: 00

SUB CODE: PH

NO REF SOV: 007.

OTHER: 006

Card 2/2

BUBEN, N.Ya., kand. fiz.-matem. nauk

The Sixth International Symposium on Free Radicals held in
England. Vest. AN SSSR 33 no.11:113-114 N '63.
(MIRA 17:1)

NIKOL'SKIY, V.G.; ALFIMOV, M.V.; BUBEN, N.Ya.

Change in electron paramagnetic resonance spectra in the optical
bleaching of irradiated organic substances. Zhur. fiz. khim.
37 no.12:2797-2798 D '63. (MIRA 17:1)

1. Institut khimicheskoy fiziki AN SSSR.

BUBEN, N.Ya.; MOLIN, Yu.N.; PRISTUPA, A.I.; SHAMSHEV, V.N.

Electron paramagnetic resonance spectrum of the cyclohexyl radical formed in the radiolysis of cyclohexane in the gas-crystal state. Dokl. AN SSSR 152 no.2:352-355 S '63.

(MIRA 16:11)

1. Institut khimicheskoy fiziki AN SSSR i Institut khimicheskoy kinetiki i goreniya Sibirskogo otdeleniya AN SSSR. Predstavleno akademikom N.N.Semenovym.

L 22443-65 E.T(m)/EPP(c)/EXP(j) Pc-4/Pr-4 RPL WW/JFW/RM
ACCESSION NR: AP5000488 S/0062/64/000/011/2090/2091

AUTHOR: Buben, N. Ya.; Kolesnikova, R. V.; Kuznetsova, N. L.; Trofimov, V. I.

TITLE: Radicals which form during reaction of atomic hydrogen with acetylene

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 11, 1964, 2090-2091

TOPIC TAGS: acetylene hydrogen reaction, C_2H_3 , C_2H_1 , hydrogen addition, hydrogen removal

ABSTRACT: This is a confirmation of an earlier assumption on the formation of the radical $\begin{array}{c} H \\ \diagup \\ C = C \cdot \\ \diagdown \\ H \end{array}$ upon reaction of hydrogen with C_2H_2 . This was confirmed by studying the electron paramagnetic resonance spectrum of the radicals formed during reaction of hydrogen atoms with acetylene in the gaseous phase at temperatures of 20 and 280 C and cooled by liquid nitrogen, as well as that of radicals obtained upon the action of H atoms on acetylene cooled to a temperature of

Cord 1/2

L 22443-65

ACCESSION NR: AP5000488

-196C. The main reaction product at temperatures below 20 C was an addition product, the C_2H_3 radical. At higher temperatures, another radical, probably C_2H , was detected in considerable yield. At temperatures of about 300 C the reaction rates of both, addition and removal of hydrogen were about the same. The technique had been described earlier and is shortly reviewed. "The authors wish to thank I. I. Chkheidze for evaluating the results." Orig. art. has: 2 figures

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences SSSR)

SUBMITTED: 30Mar64

ENCL: 00

SUB CODE: OC, GC

NR REF SOV: 003

OTHER: 001

Card 2/2

ALFIMOV, M.V.; NIKOL'SKIY, V.G.; BUBEN, N.Ya.

Thermoluminescence and ESR spectra of organic compounds
irradiated with fast electrons. Kin. 1 kat. 5 no.2:268-276
Mr-Ap '64. (MIRA 17:8)

1. Institut khimicheskoy fiziki AN SSSR.

CHKHEIDZE, I.I.; TROPIMOV, V.I.; BUBEN, N.Ya.

Radicals formed in the radiolysis of some benzene derivatives.
Zhur. strukt. khim. 5 no.4:624-627 Ag '64. (MIRA 18:3)

1. Institut khimicheskoy fiziki AN SSSR.

TRUFIMOV, V.I.; CHKHEIDZE, I.I.; BUBEN, N.Ya.

Radical concentration limit in the low-temperature radiolysis of
aromatic compounds. Kin. i kat. 5 no.4:736-739 J1-Ag '64.
(MIRA 17:11)

1. Institut khimicheskoy fiziki AN SSSR.

L 54739-65 EWG(j)/EWI(m)/EPT(c)/EPF(n)-2/EPR/EWP(j)/EWP(t)/EWP(b) Pc-4/Pr-4
Ps-4/Pu-4 IJP(c) JD/WH/RM

ACCESSION NR: AP5017886

UR/0195/64/005/005/0823/0830

AUTHOR: Boyarchuk, Yu. M.; Buben, N. Ya.; Dubovitskiy, A. V.; Manelis, G. B.

TITLE: Investigation of irradiated ammonium perchlorate by the electron paramagnetic resonance method

SOURCE: Kinetika i kataliz, v. 5, no. 5, 1964, 823-830

TOPIC TAGS: ionizing irradiation, ammonium salt, perchlorate, electron paramagnetic resonance, radiation chemistry, chemical kinetics

ABSTRACT: The nature, accumulation, and recombination of paramagnetic centers arising under the action of ionizing radiation in pure ammonium perchlorate and in NH_4ClO_4 with additions of CaO , MnO_2 (as mixtures in amounts of 2% by weight), and KMnO_4 (co-crystallized with NH_4ClO_4) were studied in the temperature range 150-400°K by the electron paramagnetic resonance method. A correlation was found between the behavior of radicals in irradiated NH_4ClO_4 and thermal decomposition of ammonium perchlorate: NH_3

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L 54739-65

ACCESSION NR: AP5017886

was found to be a good model (observed by the electron paramagnetic resonance method) for investigating typical properties and behavior of active particles formed in thermal reactions. Orig. art. has: 3 figures, 3 formulas, 7 graphs.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics, AN SSSR)

SUBMITTED: 06Oct62

ENCL: 00

SUB CODE: IC, GC

NR REF SOV: 005

OTHER: 004

JPRS

9ae
Card 2/2

L 29108-65 EWG(j)/EWT(m)/EPF(c)/EPF(n)-2/EWP(j)/EWA(h)/EWA(l) Pc-4/Pr-4/
 Feb/Pu-4 RPL WW/JFW/GG/RM
 ACCESSION NR: AP5002728 S/0195/64/005/006/1020/1027

AUTHORS: Mikhaylov, A. I.; Lebedev, Ya. S.; Buben, N. Ya.

TITLE: Stepwise recombining of free radicals in irradiated organic substances

SOURCE: Kinetika i kataliz, v. 5, no. 6, 1964, 1020-1027

TOPIC TAGS: irradiation, fast electron, free radical, kinetics, decay scheme, glycine, malonic acid, acetic acid, palmitic acid, naphthalene/ EPR 2 IKh F AN SSSR spectrometer

ABSTRACT: A systematic investigation performed on free radicals obtained by irradiation with fast electrons showed that under isothermal conditions these radicals recombine in a stepwise manner. The general characteristics of the process were determined by the study of radical decays in glycine, malonic acid, acetic acid, palmitic acid, phenol, naphthalene, etc., involving rapid and slow crystallizations of liquids in boiling nitrogen or at 0.3 - 0.5 degrees/minutes cooling. Nonpaired spins were measured with the EPR-2 IKhF AN SSSR spectrometer between -160 and +1500. Stepwise recombining occurs in wide temperature ranges: glycine (-140 to +1300); malonic acid (-140 to +700), phenol (-160 to +50). The concentration of radicals is a function of temperature and not of the thermal treatment (see Fig. 1
 Card 1/3

L 29108-65

ACCESSION NR: AP5002728

3

on the Enclosure), while the time of attaining the condition of equilibrium may vary from hours to a few seconds. Uniform crystals and frozen substances take longer. V. V. Voyevodskiy and Yu. N. Molin took part in discussions of the results, I. I. Chkheidze provided the necessary substances.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics AN SSSR)

SUBMITTED: 11Dec63

ENCL: 01

SUB CODE: 00, NP

NO REF SOV: 018

OTHER: 009

Card 2/3

L 29108-65

ACCESSION NR: AP5002728

ENCLOSURE: 01

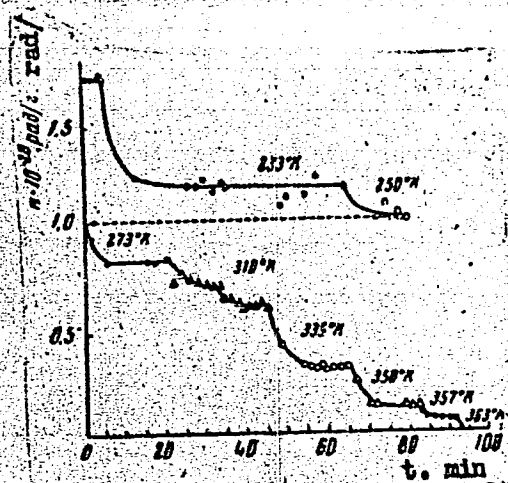


Fig. 1. Kinetics of the decay of free radicals in irradiated malonic acid at various temperatures. (powders, D = 5 M rad)

Card 3/3

L 20370-65 SWG(j)/EWT(m)/EPF(c)/EPR/EWP(j)/EWA(h)/EWA(1) Pc-4/
Pr-4/PS-4/Peb RPL/ASD(a)-5/SSD/AFWL/AS(mp)-2/RAEM(c)/RAEM(i)/ESD(gs)/
ESD(e) WW/RM
ACCESSION NO: AP4038528 S/0020/64/156/003/0630/0633

AUTHOR: Alfimov, M.V.; Buben, N.Ya.; Pristupa, A.I.; Shamshev, V.N.

TITLE: Excitation of triplet states of naphthalene / molecules in solid solution by fast electrons

SOURCE: AN SSSR. Doklady*, v. 156, no. 3, 1964, 630-633

TOPIC TAGS: molecular triplet state, organic molecule, fast electron irradiation, naphthalene solid solution, electronic paramagnetic resonance

ABSTRACT: Irradiation of organic molecules with fast electrons may result in the formation of molecular triplet states which have a higher chemical activity. The observation of the latter is possible by the method of electronic paramagnetic resonance of molecules at the fluorescence energy levels (see C.A. Hutchison and B.W. Mangam, J. Chem. Phys. 29, 952, 1958). The present paper deals with the use of this method for the determination of concentration of molecules in the triplet state on irradiation of solid naphthalene solutions by fast electrons. Mixtures of polymethyl methacrylate and polystyrene with naphthalene were used as specimens. Samples of about

Card 1/2

L 20370-65
ACCESSION NR: AP4038528

0.1 gm were irradiated by electrons of 1.6 Mev in the resonator at 100 K. An assymetric line of paramagnetic absorption was observed with a width $\Delta H = 10^4$ oersted. The line decayed exponentially with $\tau = 2.5 \pm 0.5$ sec. The decay of the triplet state can be explained by the transfer of excitation energy to the aromatic molecules and by formation of radicals. "The authors are grateful to I.V. Alexandrov, A.T. Koritskiy, and V.G. Nikol'skiy for the discussion of results." Orig. art. has: 3 figures

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR
(Institute of Chemical Physics, Academy of Sciences, SSSR)

SUBMITTED: 09Jan64

ENCL: 00

SUB JODE: NP, OC

NR REF SOV: 008

OTHER: 004

Card 2/2

L 39695-65 EPF(c)/EWP(j)/EW(m) Pc-1/Pr-1 EPL RM

ACCESSION NR: AP5006772

S/0195/65/006/001/0048/0055

AUTHOR: Mikhaylov, A. I.; Lebedev, Ya. S.; Buben, N. Ya.

TITLE: "Step" recombination of free radicals in irradiated organic compounds. II. Examination of a formal-kinetic model and of a method of evaluating kinetic constants

SOURCE: Kinetika i kataliz, V. 6, no. 1, 1965, 48-55

TOPIC TAGS: recombination, recombination reaction, free radical, organic material

ABSTRACT: Several models of the "step" recombination of free radicals in a solid phase are discussed. The results of a formal-kinetic calculation are compared with experimental data. An experiment is proposed to permit judgment as to the spatial distribution of free radicals. The following hypothetical models are advanced to explain the origin of a quasi-stationary "step" in the recombination of radicals in a solid phase: 1) radicals located in zones (crystallites) with different softening temperatures; 2) radicals fixed in traps with different energies of stabilization; and 3) the probability of the recombination of a pair of radicals depends on the distance between them. "In conclusion the authors consider it their pleasant duty to express gratitude to V. V. Voyevodskiy and Yu. M. Molin for their frequent

Card 1/2

L 39695-65

ACCESSION NR: AP5006772

analysis of the results of the work." Orig. art. has: 2 figures, 1 table, 12 equations.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics, Academy of Sciences SSSR)

SUBMITTED: 11Dec63

ENCL: 00

SUB CODE: GC, UC

NO REF SOV: 008

OTHER: 008

Cord 2/2 PV

L 54730-65 EWG(j)/EWT(m)/EPF(c)/EPF(n)-2/ENP(j)/EWA(h)/EWA(c)/EWA(l) Pc-A/

Pr-4/Feb/Pu-4 RPL GG/RM

ACCESSION NR: AP5011684

UR/0195/65/006/002/0329/0331

541.515'15'124

AUTHOR: Tikhomirov, L. A.; Duben, N. Ya.

TITLE: Decomposition of free radicals by ionizing radiation

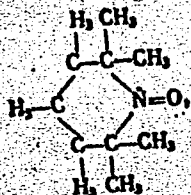
SOURCE: Kinetika i kataliz, v. 6, no. 2, 1965, 329-331.

TOPIC TAGS: free radical, kinetics, electron paramagnetic resonance, ionization

ABSTRACT: The analysis of accumulation curves for free radicals produced by γ - or fast electron irradiation of a number of compounds indicates that both decomposition and free radical production takes place in the irradiation field even at temperatures which are low enough to practically prevent diffusion. The authors attempted to obtain direct experimental evidence of the rate of radiation decomposition of stable radicals in the solid phase containing no impurity molecules. For this purpose 2,2,6,6-tetramethylpiperidine nitric oxide radical was selected

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L 54730-65
ACCESSION NR: AP5011684



since it is highly stable. The samples were irradiated with 1.6 Mev electrons directly in the cavity of the EPR spectrometer so that the change in radical concentration as a function of the irradiation dose could be measured continuously. The reduction in the number of free radicals in the sample obeys the exponential decay law

$$N = N_0 e^{-kt}$$

where N is the number of the free radicals, t is irradiation time and k is a constant. It was found that k is a linear function of the dose intensity. Kinetic curves were plotted in the 100-300°K interval. The decomposition of radicals conforms to the Arrhenius law with a very low energy of activation, $E = 0.4$ kcal/mol.

Card 2/3

L 54730-65
ACCESSION NR: AP5011684

Orig. art. has: 1 figure.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics,
AN SSSR)

SUBMITTED: 02Sep64

ENCL: 00

SUB CODE: NP, GC

NO REF SOV: 004

OTHER: 003

Card 3/3

L 54584-65
 FEB DIAAP/RPL WW/RM
 ACCESSION NR: AP501277
 EWG(j)/EWT(m)/EPF(c)/EPR/EWP(j)/EWA(h)/EWA(i) Pc-4/Pr-4/Ps-4/
 UR/0062/65/000/004/0594/0598
 541.15+541.51

AUTHORS: Tikhomirov, L. A.; Belyayeva, V. A.; Buben, N. Ya.

TITLE: The kinetics of free radical build-up during radiolytic decomposition of solid substances

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 4, 1965, 594-598

TOPIC TAGS: radiolysis, free radical, electron paramagnetic spectrometer, electron paramagnetic resonance, reaction rate

ABSTRACT: The method of electron paramagnetic resonance was used to study the build-up and recombination of radicals CH_2OH and CH_3CHOH in the irradiated compounds $\text{CaCl}_2 \cdot 4\text{CH}_3\text{OH}$ and $\text{CaCl}_2 \cdot 3\text{C}_2\text{H}_5\text{OH}$. The samples were bombarded with electrons having energies of 1.6 mev directly in the resonator of an electron paramagnetic spectrometer. It was found that the limiting concentrations of the alcohol radicals in irradiated crystals do not depend on the radiation dosage. The reaction rate constant increases slowly with rise in temperature, not changing greatly for the different substances examined. This suggests that the process of radical

Card 1/2

L 54584-65

ACCESSION NR: AP5012447

destruction is the same for the different substances. If irradiation does not appreciably affect the recombination rate of the radicals (in the temperature range 240-300K) then two processes of first-order radical destruction may be effective. First, the radiation itself may not only generate radicals, but destroy them as well, with formation of hydrogen atoms and molecules with double bonds. Secondly, the large number of radicals may not be uniformly distributed through the substance but rather be in pairs and groups, leading to first-order destruction of the radicals and to weak temperature dependence of the reaction rate constant. The dominant process can be determined only by examining the final products of solid-phase radiolytic decomposition. The temperature dependence of the reaction rate constant does not obey the Arrhenius equation. Orig. art. has: 4 figures.

ASSOCIATION: Institut khimicheskoy fiziki, Akademi nauk SSSR (Institute of Chemical Physics, Academy of Sciences, SSSR)

SUBMITTED: 26Dec63

ENCL: 00

SUB CODE: SS, NP

NO REF SOV: 007

OTHER: 008

Card 2/2

L 60983-65 EPP(c)/EWG(j)/EWA(h)/EWF(j)/EWT(m)/EWA(1) Pc-4/Pr-4 RM
 UR/0076/65/039/007/1662/1668
 541.15:547.024

ACCESSION NR: AP5019792

AUTHOR: Trofimov, V. I.; Chkheidze, I. I.; Buben, N. Ya.

TITLE: Limiting concentrations of radicals in simple aromatic compounds

SOURCE: Zhurnal fizicheskoy khimii, v. 39, no. 7, 1965, 1662-1668

TOPIC TAGS: free radical, electron spin resonance, aromatic compound radiolysis

ABSTRACT: The electron spin resonance method was used to determine the limiting radical concentrations N_{lim} during low-temperature radiolysis of a series of aromatic compounds. The measurements were made with an EPR-2 spectrometer mounted in the path of a beam of fast 1.6 Mev electrons. All N_{lim} values were independent of the dose rate (which ranged from 4 to 40 mrad/min). In all cases, the N_{lim} values decreased linearly with rising temperature. Calculation by the least squares method gave the following relations:

benzyl chloride	$C_6H_5CH_2Cl$	$N_{lim} = 4.7 \cdot 10^{19} - 1.9 \cdot 10^{17} T,$
aniline	C_6H_5Cl	$N_{lim} = 2.6 \cdot 10^{19} - 1.1 \cdot 10^{17} T,$

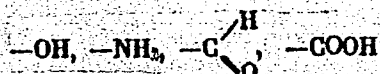
Card 1/3

L 60983-65

ACCESSION NR: AP5019792

chlorobenzene $C_6H_5NH_2$ $N_{lim} = 3.2 \cdot 10^{19} - 0.9 \cdot 10^{17} T$,
p-xylene $C_6H_5(CH_3)_2$ $N_{lim} = 7.1 \cdot 10^{20} - 2.8 \cdot 10^{18} T$.

The effect of the distribution of radicals on N_{lim} was confirmed experimentally. In terms of the limiting radical concentrations, all the compounds studied can be divided into two groups. The first consists of aliphatic benzene derivatives $C_6H_n(RH)_{6-n}$ in the radiolysis of which $N_{lim} > 10^{20} g^{-1}$; the second includes benzene derivatives with the substituents



etc., for which $N_{lim} \approx (1-4) \cdot 10^{19} g^{-1}$. It was found that the low values of N_{lim} in compounds of the second group are explained by the fact that during radiolysis, a single event produces a pair of radicals from two neighboring molecules as a result of transfer of energy to the functional groups of these molecules, the groups being linked by a hydrogen bond. It is shown that none of the theoretical explanations heretofore offered for the N_{lim} values satisfactorily agrees with the experimental data. "The authors thank G. K. Voronova for assistance in the work." Orig. art.

Card 2/3

L 60983-65

ACCESSION NR: AP5019792

has: 7 figures, 1 table, and 4 formulas.

ASSOCIATION: Institut khimicheskoy fiziki, Akademiya nauk SSSR (Institute of Chemical Physics, Academy of Sciences, SSSR)

SUBMITTED: 07Apr64

ENCL: 00

SUB CODE: GC, NP

NO REF SOV: 011

OTHER: 006

Card ⁷¹⁶ 3/3

BUBEN, N.Ya.; GOL'DANSKIY, V.I.; ZLATKEVICH, L.Yu.; NIKOL'SKIY, V.G.;
RAYEVSKIY, V.G.

Polymer mixtures studied by radiothermoluminescence. Dokl.
AN SSSR 162 no.2:370-372 My '65. (MIRA 18:5)

1. Institut khimicheskoy fiziki AN SSSR i Mosko'skiy tekhnologicheskoy
institut myasnoy i molochnoy promyshlennosti. 2. Chlen-korrespondent
AN SSSR (for Gol'danskiy).

L 62692-65 ENG(j)/ENT(m)/EPF(c)/EAT(j)/EWA(h)/EWA(l) Pc-l/Pr-l/Feb DIAAP/
RPL RM
ACCESSION NR: AP5018749 UR/0020/65/163/002/0414/0417

AUTHOR: Tikhomirov, L.A.; Buben, N.Ya.

TITLE: Radiolysis of solid solutions of stable radicals in isopropyl alcohol

SOURCE: AN SSSR. Doklady, v. 163, no. 2, 1965, 414-417

TOPIC TAGS: free radical radiolysis, solid state radiolysis, isopropyl alcohol, free radical annihilation

ABSTRACT: The authors studied the kinetics of annihilation of stable free radicals of 2,2,6,6-tetramethylpiperidine hydroxylamine in frozen isopropyl alcohol irradiated with 1.6 MeV electrons at 100K. The concentration of these radicals and of the alcohol radicals was followed by means of electron spin resonance spectra in the course of the irradiation, and the dependence of the radical concentration on the irradiation dose was studied. The disappearance of the stable radicals was found to obey the law

$$N_1 = N_0 e^{-k_1 D}, \quad (1)$$

where D is the dose, K_1 is a constant. The accumulation of the alcohol radicals follows the relation

$$N_2 = N_{\text{exp}} [1 - e^{-k_2 D}], \quad (2)$$

Card 1/2

1. 62692-65

ACCESSION NR: AP5018749

2

where N_{2lim} is the limiting concentration of alcohol radicals and K_2 is a constant. Using mass spectrometry, the authors compared the yields of molecular hydrogen during irradiation of pure isopropyl alcohol and isopropyl alcohol containing 3×10^{20} radicals/g at 100K; this yield was 25% lower in the latter case. It was shown that not more than 25% of all the stable radicals annihilated during radiolysis react with the atomic hydrogen formed by the irradiation. In solid solutions, the stable radicals are annihilated with a very high radiation yield (240 radicals per 100 eV of energy absorbed by the radicals). One of the most important findings is the equality of the constants k_1 and k_2 ; it means that the probability of annihilation of the stable radicals is the same as for alcohol radicals during their accumulation. The probability of annihilation of a radical by the radiation is 250 times greater than the creation of a new radical. This is attributed to the transfer of energy by the solvent. "The authors thank V.I. Gusynin for assistance in the work." Orig. art. has: 1 figure, 2 formulas and 1 table.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences, USSR)

SUBMITTED: 21Nov64

ENCL: 00

SUB CODE: OC, NP

NO REF SOV: 007

OTHER: 003

Cord 2/2

L 00062-66 EWT(1)/EPF(c)/EPA(w)-2/EWA(m)-2 IJP(c) WW/GG/AT

ACCESSION NR: AP5021346

UR/0120/65/000/004/0134/0135

539.18

AUTHOR: Blazhevich, I. N.; Buben, N. Ya.; Malysenko, A. N.

TITLE: A device for the detection of electron paramagnetic resonance spectra at the 21 cm wavelength during fast electron exposures

SOURCE: Pribery i tekhnika eksperimenta, no. 4, 1965, 134-135

TOPIC TAGS: electron paramagnetic resonance, electron paramagnetic spectrometer, electron radiation, ionizing radiation

ABSTRACT: During the study of free radicals formed in the course of exposure of matter to ionizing radiations the authors used, in addition to another device, a spectrometer allowing the observation of electron paramagnetic resonance spectra of radicals in weaker magnetic fields. This article describes this instrument which functions on the 21 cm wavelength appearing during the exposure of matter to fast electrons. The electron beam is introduced along the axis of the solenoid producing the magnetic field. The temperature of the sample can vary between -180 and +100C. Typical signals are shown in Fig. 1 of the Enclosure. "The authors thank A. G. Semenov for valuable advice and A. V. Gusev for his

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L 00062-66

ACCESSION NR: AP5021346

help during accelerator work." Orig. art. has: 2 figures.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR, Moscow (Institute of Chemical Physics, AN SSSR)

SUBMITTED: 21May64

44, 55
ENCL: 01

SUB CODE: OP, NP

NO REF SOV: 002

OTHER: 001

Card

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L 00062-66

ACCESSION NR: AP5021346

ENCL: 01

0

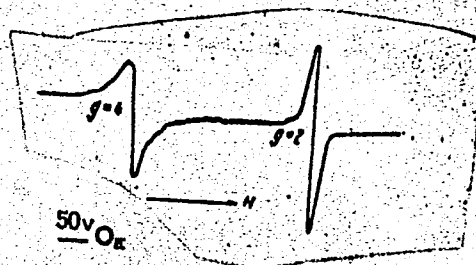


Fig. 1. Signal from the peroxidized radical in teflon, recorded simultaneously with the standard (glass "Luch 2").

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L 10838-66 EWT(1)/EWT(m)/EWP(j)/EWA(h)/EWA(m)-2/EWA(1) IJP(c)/RPL AT/RM/GS

ACC NR: AT5023442

SOURCE CODE: UR/0000/65/000/000/0163/0167

AUTHOR: Nikol'skiy, V. G.; Tochir, V. A.; Buben, N. Ya.

ORG: none

TITLE: Investigation of electrons stabilized in certain saturated hydrocarbons by means of optical methods

SOURCE: Simpozium po elementarnym protsessam khimii vysokikh energii. Moscow, 1963. Elementarnyye protsessy khimii vysokikh energii (Elementary processes of the chemistry of high energies); trudy simpoziuma. Moscow, 1965, 163-167

TOPIC TAGS: alkane, mass spectrum, photoluminescence, free radical, electron trapping, electron bombardment, spectrophotometer

ABSTRACT: Photoluminescence and color of hexane, nonane, 2,4-dimethyldecane, tetradecane, cyclohexane, dicyclohexyl-4-decane, 1,2-dicyclohexyldodecane, and high density polyethylene were studied during irradiation with fast electrons at 77°K. The irradiation dose varied from $5 \cdot 10^4$ to $2 \cdot 10^8$ rads. The spectra were taken with CF-2M spectrophotometer. The objective was to learn more about the nature of the electron traps which fix electrons during radiolysis of saturated hydrocarbons at low temperatures. After radiolysis saturated hydrocarbons exhibit photoluminescence (4000-6000 Å). The photoluminescence and color are due to stabilized ions present in the

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L 10838-66

ACC NR: AT5023442

saturated hydrocarbons. The number and depth of electron traps increase with the irradiation dosage. By nature, the electron traps occurring in saturated hydrocarbons during irradiation are stabilized radicals. These radicals are capable of recombination under heating.

SUB CODE: 07/

201

SUBM DATE: 23Feb65/

ORIG REF: 002/

OTH REF: 002

Card 2/2

L 19365-66 EWT(m)/EWP(j)/EWA(h)/EWA(l) WW/RM

ACCESSION NR: AP5013758

UR/0020/65/162/002/0370/0372

AUTHOR: Buben, N. Ya.; Gol'danskiy, V. I. (Corresponding member AN SSSR); Zlatkevich, L. Yu.; Nikol'skiy, V. G.; Rayevskiy, V. G.

18
15
β

TITLE: Study of a polymer mixture by radiothermoluminescence

SOURCE: AN SSSR. Doklady, v. 162, no. 2, 1965, 370-372

TOPIC TAGS: polymer, thermoluminescence, radiothermoluminescence, butadiene elastomer

ABSTRACT: Radiothermoluminescence was used in this work to evaluate the extent of homogeneity of polymer mixtures. Butadiene elastomers SKB¹² and SKD, identical in composition but differing with regard to content of vicinal bonds, were mixed on rollers in various proportions. After degassing, the mixture samples were irradiated with fast electrons at 77K (dose: 1 rad) and allowed to warm up at the rate of 10—12° per min. Previous work had shown that each of the two elastomers had a well-resolved luminescence maximum corresponding to the vitrification temperature of the elastomer. It was found in the present work that when the two elastomers are mixed insufficiently the mixture exhibits two luminescence maxima. On the other hand, when the mixture is sufficiently homogeneous, only one maximum is observed,

Card 1/2

L 27364-66 EWT(1)/EWT(m)/EWP(j) IJP(c) WW/GG/RM
 ACC NR: AP6011553 SOURCE CODE: UR/0051/66/020/003/0424/0426

AUTHORS: Alfimov, M. V.; Buben, N. Ya.; Pristupa, A. I.;
 Shamshev, V. N.

ORG: none

TITLE: Determination of the concentration of organic molecules in the triplet state upon excitation with fast electrons

SOURCE: Optika i spektroskopiya, v. 20, no. 3, 1966, 424-426

TOPIC TAGS: electron paramagnetic resonance, electron bombardment, electromagnetic wave absorption, line width, absorption probability, nonmetallic organic derivative, *fast particle, molecule*

ABSTRACT: This is a continuation of earlier work (DAN SSSR v. 156, 630, 1964 and earlier) in which it was shown that the method of electron paramagnetic resonance can be successfully used to study triplet states of organic molecules excited by bombardment with fast electrons. To improve on the accuracy of the results, the authors determined experimentally the ratio of the probabilities of absorption of a

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UDC: 535.34:538.113

L 27364-66

ACC NR: AP6011553

2
microwave quantum for the transition with $\Delta m = \pm 2$ to the transitions with $\Delta m = \pm 1$, by investigating the stationary concentrations of $C_{10}D_8$ molecules in the triplet state and the kinetics of their accumulation at different irradiation dose intensities. The sample preparation and their measurement technique are briefly described. Irradiation of a solid solution of $C_{10}D_8$ in polystyrene at 100K produced a single paramagnetic absorption line at a field 5927 Oe ($f = 9205$ Mcs), the line width between maximum slope points was 7 ± 0.5 Oe. The probability ratio was determined by determining the stationary concentration of the molecules by comparison with a standard. In addition, the kinetics of accumulation of $C_{10}D_8$ molecules in the triplet state following irradiation with fast electrons was measured by the procedure used in the earlier investigation. Expressions are given for the stationary concentration and for the characteristic accumulation time, which agree well with the experimental data. The experimental value of the probability ratio (~ 22) is much larger than the theoretical value (4.5). It is shown further that by using

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ACC NR: AP6011553

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the EPR method to determine the characteristic accumulation time and the lifetime of the molecules in the triplet state after cessation of the irradiation it becomes possible to determine the molecule concentration in the triplet state without involving the probability-ratio coefficients. In view of the uncertainty of the actual value of this coefficient and this disparity with the theoretical value, the elimination of this coefficient is considered an advantage. The authors thank I. V. Aleksandrov, V. L. Yermolayev, and K. K. Pukhov for a discussion of the results. Orig. art. has: 2 figures and 6 formulas.

SUB CODE: 20/ SUBM DATE: 11Jan65/ ORIG REF: 004

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3/3

L 26359-66 EWT(m)/EPF(n)-2/EWP(j)/EWA(h)/EWA(1) WW/JW/GG/KK (Y)

ACC NR: AP6013381

SOURCE CODE: UR/0195/66/007/002/0230/0236

AUTHOR: Chkheidze, I. I.; Molin, Yu. N.; Mironov, V. F.; Chernyshev, Ye. A.; Buben, N. Ya.; Voyevodskiy, V. V.

ORG: Institute of Chemical Physics AN SSSR (Institut khimicheskoy fiziki AN SSSR); Institute of Kinetics and Combustion, SO AN SSSR (Institut kinetiki i goreniya SO AN SSSR); Institute of Organic Chemistry im. N. D. Zelinskiy, AN SSSR (Institut organicheskoy khimii AN SSSR)

TITLE: Formation of radicals during the radiolysis of organic solids. Part 3: EPR spectra and radiation yields of radicals in certain organosilicon compounds

SOURCE: Kinetika i kataliz, v. 7, no. 2, 1966, 230-236

TOPIC TAGS: free radical, organosilicon compound, irradiation effect, EPR spectrum

ABSTRACT: The EPR method was used to investigate the radical processes involved in the low-temperature radiolysis of certain organosilicon compounds with a view to determining the effect of the silicon atom entering into the aliphatic chain on the effectiveness and direction of primary radiochemical processes. The radiation yields of the radicals (G_R) formed by irradiating the compounds with fast electrons at temperatures from -130 to -180°C were determined by the EPR method. It was found that G_R for saturated and aromatic substituted derivatives of tetramethylsilane did not

UDC: 541.15-16

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ACC NR: AP6013381

differ from G_R for hydrocarbons of similar structure and amounted to 4-5 1/100 ev and 0.2-0.6 1/100 ev, respectively. For compounds of the general formula $(CH_3)_3Si(CH_2)_nCH=CH_2$ ($n = 0, 1, 2$), the radiation yield is $G_R = 1$ 1/100 ev, which is approximately 4 times less than for hydrocarbons with double bond. Analysis of the EPR spectra showed that the introduction of a silicon atom in the aliphatic chain does not produce any appreciable changes in the radiolysis mechanism. Orig. art. has: 7 figures, 2 tables, 5 formulas.

SUB CODE: 07, 20/ SUBM DATE: 12Sep64/

ORIG REF: 008/

OTH REF: 005

Card 2/2

L 04180-67 EWT(m)/EWP(j) JW/RM

ACC NR: AP6029226

SOURCE CODE: UR/0195/66/007/003/0540/0542

AUTHOR: Trofimov, V. I.; Belen'kiy, L. I.; Buben, N. Ya.; Chkheidze, I. I.

ORG: Institute of Chemical Physics, AN SSSR (Institut khimicheskoy fiziki AN SSSR)

TITLE: Free radical formation during radiolysis of organic compounds in the solid state. IV. Radiative free radical yields in certain sulfur-containing compounds

SOURCE: Kinetika i kataliz, v. 7, no. 3, 1966, 540-542

TOPIC TAGS: free radical, radiation chemistry, EPR spectrum, radiation effect

ABSTRACT: Radiative free radical yields (G_R) for hexylmercaptan, dihexyldisulfide, thiophenol, and thiophene and its derivatives were determined by EPR technique. The EPR spectra of the various samples irradiated with electrons having an energy of 1.6 Mev at -115°C to -190°C were taken directly using an EPR-2-IKhF device. The radiative free radical yields were determined from the initial linear portion of the free radical build-up curve. The accuracy of the free radical yields determination was 40%. The radiative free radical yields were found to be equal to 0.4 for hexylmercaptan and dihexyldisulfide, 0.2 for thiophenol, 0.18 for thiophene, and 0.03 for 2-chloro- and 3-bromothiophene. This indicates that the presence of -S-H and -S-S- groups results in great radiation resistance. (For comparison, the radiative free radical yields re-

UDC: 541.15

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L 04180-67

ACC NR: AP6029226

ported in the literature for saturated hydrocarbons and alcohols are 4-5 and 5-8, respectively). The authors thank E. M. Nanobashvili for supplying certain samples and discussion of the results and M. V. Panchvidze for assistance in carrying out the experiments. Orig. art. has: 2 figures, 1 table. 2

SUB CODE: 07/

SUBM DATE: 13May65/

ORIG REF: 012/

OTH REF: 003

Card 2/2 LC

L 06516-67 EWT(m)/EWF(j) RM

ACC NR: AP7000492

SOURCE CODE: UR/0020/66/168/002/0360/0363

TOCHIN, V. A., NIKOL'SKIY, V. G., HUBEN, N. Ya., Institute of Chemical Physics,
Academy of Sciences USSR (Institut khimicheskoy fiziki AN SSSR)

"Determination of the Yield of Stabilized Charges in Low-Temperature Radiolysis
of Organic Systems"

Moscow, Doklady Akademii Nauk SSSR, Vol 168, No 2, 1966, pp 360-363

Abstract: The electron paramagnetic resonance method was used to obtain quantitative data on the yields and limiting concentrations of ion radicals stabilized in the low-temperature radiolysis of organic substances. The accumulation of paramagnetic particles during irradiation within the dose interval 0.2-30 Mrad and the change in the electron paramagnetic resonance spectra under the action of visible light were investigated on a broad range of organic substances, including saturated hydrocarbons (hexane, n-decane, 2,7-dimethyloctane, cyclohexane, dicyclohexyl-4-decane, polyethylene), aromatic hydrocarbons (benzene, toluene, ethylbenzene, styrene, cumene, diphenylmethane, polystyrene), alcohols (ethyl, isopropyl, polyvinyl), ketones (acetone, methyl ethyl ketone, acetophenone), heterocyclic compounds (tetrahydrofuran, 2-methyltetrahydrofuran, dioxane), and certain ethers and organosilicon compounds. The influence of visible light and the addition of electron acceptor additives (CCl₄, CS₂,

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ACC NR: AP7000492

naphthalene, and diphenyl) on the electron paramagnetic resonance signal were studied. This paper was presented by Academician V. V. Voyevodskiy on 4 September 1965. The authors thank D. N. Sapozhnikov for assistance in carrying out the measurements. Orig. art. has: 3 figures and 1 table. [JPRS: 37,023]

TOPIC TAGS: EPR, radiation chemistry, ketone, heterocyclic base compound, organosilicon compound, hydrocarbon

SUB CODE: 07 / SUBM DATE: 20 Aug 65 / ORIF GRE: 010 / OTH REF: 005

Card 2/2 15

L 36966-66 EWT(m)/EWP(j) RM

ACC NR: AP6027806

SOURCE CODE: UR/0063/66/011/002/0228/0233

AUTHOR: Buben, N. Ya. (Candidate of physico-mathematical sciences); Chkheidze, I. I. (Candidate of chemical sciences)

ORG: none

TITLE: Mechanism of formation of radicals during radiolysis of aromatic compounds in the solid phase

SOURCE: Vsesoyuznoye khimicheskoye obshchestvo. Zhurnal, v. 11, no. 2, 1966, 228-233

TOPIC TAGS: reaction mechanism, free radical, free radical stabilization, chemical bonding

ABSTRACT: This is a review of research on free radicals during the low temperature radiolysis of a number of simple aromatic compounds conducted mainly at the Institute of Chemical Physics, Academy of Sciences USSR. Primary chemical reactions in solid organic substances, determined mostly by the possibility of stabilization of the radicals being formed, are not limited only to cleavage of light radicals (above all hydrogen) which are capable of leaving the Frank-Rabinovich "cage". In addition to this, reactions in which the terminal functional groups of certain neighboring molecules are simultaneously disrupted or some bonds in a complex molecule are broken to form molecular products and radicals, sufficiently removed from one another for stabilization in the matrix, can exert a substantial role. Investigation of the low-

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UDC: 541.1

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L 36966-66

ACC NR: AP6027806

temperature radiolysis of organic substances indicated that the radiation yield of radicals in the solid phase can be used for the quantitative estimation of the radiation stability of the compound. To accomplish this it is only necessary to measure the radical yield at a sufficiently low temperature to exclude the recombination of heavy radicals. In fulfilling this condition, the decomposition of one molecule of the initial substance in relation to the radiolytic mechanism will result in the stabilisation of either one or two radicals. Orig. art. has: 5 figures and 2 tables.
[JPRS: 36,455]

SUB CODE: 07 / SUBM DATE: none / ORIG REF: 019 / OTH REF: 010

Card 2/2 *llb*

Buben, F.

Country : CZECHOSLOVAKIA
 Category : Chemical Technology. Pharmaceuticals. Vitamins. Antibiotics
 Abs. Jour : Ref Zhur-Khimiya, No 14, 1959, No 50715
 Author : Buben, F.; Korbl, J.
 Institute : -
 Title : Complexometric Titration Employed in Pharmaceutical Analyses. XVII. Determination of Bismuth
 Orig Pub. : Ceskosl. farmac., 1958, 7, No 2, 78-79
 Abstract : Developed is the direct complexometric method for quantitative determination of Bi in pharmaceutical preparations. It is based on the titration of Bi ions at a pH of approx. 1.0 with 0.05 M solution of "chelator-3" and with the use of methylthiomole blue or xylenole orange as indicators. An organic Bi compound has to be converted into an inorganic form by boiling it with a mixture (1:1) of 70% HClO₄ and 35% HNO₃. It is proposed to intro-
 Card: 1/2

Country .

L 39612-26 EWP(1) JD/CD-2

ACC NR: AP6010384

SOURCE CODE: CZ/0031/65/000/005/0376/0377

AUTHOR: Alexander, P. (Engineer); Dolezil, M. (Doctor; Candidate of sciences);
Bubanicak, J.; Vesely, J. (Engineer)

ORG: none

TITLE: Method of treating steel slag ¹⁴

SOURCE: Hutnicke listy, no. 5, 1965, 376-377

TOPIC TAGS: slag, steel, magnetic separation

ABSTRACT: Article is an abstract of Czechoslovak Patent Application Class 18a, 1/00, PV 801-64, dated 12 Feb 1964, Steel slag obtained after separation of steel pieces larger than 200 to 2500 mm is broken into lumps smaller than 200-250 mm by crushing, classified and subjected to magnetic separation. The basis of the invention is a suggestion to remove after crushing particles of steel larger than 3 mm and the dust smaller than 1 mm and subject the remainder to magnetic separation into steel and slag. The parts larger than 3 mm are crushed again and treated as described above. The nonmagnetic fraction is crushed again to sizes below 1 mm. This process allows a preparation of products with varying grain sizes suitable for application in various industries. Various kinds of mills may be used to obtain suitable particle sizes. [JPRS]

SUB CODE: 11, 13 / SUBM DATE: none

Card 1/1

L 31099-66 EWP(t)/ETI IJP(c) JD/JH

ACC NR: AP6022774

SOURCE CODE: CZ/0039/66/027/002/0068/0070

AUTHOR: Bubenick, Milan (Engineer)

ORG: TESLA Lanskroun, n. p.

TITLE: Influence of silica on the formation of the dielectric layer in aluminum electrolytic capacitors

SOURCE: Slaboproudy obsor, v. 27, no. 2, 1966, 68-70

TOPIC TAGS: silica, dielectric layer, electrolytic capacitor, aluminum, water, oxide formation, alumina

ABSTRACT: The article reports on an investigation of the influence of the silica contents in water on the formation of a hydrogenated oxide layer on aluminum and on the forming capacity of an aluminum anode for electrolytic capacitors. The admissible limit of alumina contents in water is evaluated and, on the basis of the results obtained, a new procedure is suggested for checking demineralized water. Orig. art. has: 4 figures. [JPRS]

SUB CODE: 07, 09 / SUBM DATE: 20Sep65 / ORIG REF: 001 / OTH REF: 002

Card 1/1

UDC: 621.319.45

S/196/62/000/022/002/007
E194/E155


AUTHOR: Bubenicek, Milan

TITLE: A method of producing a dielectric oxide layer on an aluminium anode

PERIODICAL: Referativnyy zhurnal, Elektrotehnika i energetika, no.22, 1962, 22, abstract 22 B 81 P. (Czech. pat. cl. 48 a, 16/01, no.99985, June 15, 1961)

TEXT: During step-wise continuous forming, the aluminium foil is stretched through several baths which are at successively higher voltages. The resistivity of the electrolyte in the baths should be increased correspondingly, to avoid sparking during forming. As the baths are used the resistivity of the electrolyte diminishes and sparking occurs, so the electrolyte must be replaced periodically. It is proposed to discard the electrolyte only from the first bath, transferring to it that from the second, and so on. In all the baths the electrolyte should be of the same composition (for example, boric acid and borax), only the concentration differing. After transferring the electrolytes it is proposed to correct the resistivity by the addition of borax.

Card 1/1 [Abstractor's note: Complete translation.]



BUHENICEK, Milan, inz.

Electrolytic capacitors for wide temperature range. Sdel tech
12 no. 6:208 Ja '64.

BUBENIK, ANTONIN.

Jagd und Fishfang in der Tschechoslowakei (von) Antonin Bubenik.
Landwirtschaftliche Schonheiten und Kulturschatze der
Tschechoslowakei (von) Zdenek M. Zenger. Übers. von Brigitta
Neumannova. Prague, Cedok (1953) 73 p.

SOURCE: EAST Eurpoean Accessions List (EEAL) Library of Congress.
Vol. 5, No. 7, July 1956.

BUBENIK, A.

BUBENIK, A.

Radioactive tracers in the research of the Czechoslovak Academy of Agricultural Sciences.

p. 223

Vol. 3, no. 4, 1956

BESEDA VENKOVSKÉ RODINY

Praha

SO: Monthly List of East European Accessions (EEAL), LC, Vol. 5, no. 12
December 1956

BUBENIK, -A.

Biological balance in the deer population. p.21.

SBORNÍK. RADA LESNICTVÍ, Prague, Vol. 29, no. 1, Jan. 1956.

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 5, No. 6 June 1956, Uncl.

BUBENIK, A., AND OTHERS.

Feeding on forest trees by antler-bearing game from the point of view of their physiological needs. p. 347.

(Sbornik Rada Lesnictvi, Vol. 30, no. 4, April 1957, Praha, Czechoslovakia)

SO: MONTHLY LIST OF EAST EUROPEAN ACCESSIONS (EEAL) LC, VOL. 6, no. 10, October 1957. Uncl.

BUBENIK, J.; KOLDOVSKY, P.

Detection of antitumour immunity by a cytotoxic test. Folia biol. 8
no.6:363-366 '62.

1. Institute of Experimental Biology and Genetics, Czechoslovak Academy
of Sciences, Prague.

(NEOPLASMS, EXPERIMENTAL)

KOLDOVSKY, P.; BUBENIK, J.

Difference between the parental strain and the F_1 hybrid in the isoimmune reaction to tumours. Folia biol. (Praha) 9 no.6:420-423 '63.

1. Institute of Experimental Biology and Genetics, Czechoslovak Academy of Sciences, Prague.

(NEOPLASMS, EXPERIMENTAL)

(NEOPLASM IMMUNOLOGY)

(BENZOPYRENES) (HYBRIDIZATION)

(CARCINOGENS)

BUBENIK, J.; ADAMCOVA, Berta; KOLDOVSKY, P.

A contribution to the question of the antigenicity of spontaneous lymphoid AKR Leukaemia. Folia biol. (Praha) 10 no.4:293-300 '64.

1. Institute of Experimental Biology and Genetics, Czechoslovak Academy of Sciences, Prague.

BUBENIK, J.; IVANYI, J.; KOLDOVSKY, P.

Heterogeneity of antitumour antibodies. Folia biol. (Praha)
11 no.3:240-242 '65

1. Institute of Experimental Biology and Genetics, Czechoslovak
Academy of Sciences, Prague.

BUBENIK, Jan

BUBENIK, Jan., MUDr (Praha)

Regenerating capacity of injured dental pulp. Prakt. sub. lek.,
Praha 2 no. 4:74-83 1954.

(DENTAL PULP, physiology,
regen.)

(REGENERATION,
dent. pulp)

BUBENIK, J.

"Damage to the Jaws and Teeth From Treatment of Facial Disturbances by Radium and X Ray." p. 224. (Casopis Lekaru Ceskych. Vol. 93, no. 9, Feb. 1954. Praha).

SO: Monthly List of ^{East European} ~~Russian~~ Accessions / Vol. 3, No. 6
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HUBENIK, J.

Immunity against cancerogen-induced tumours. Neoplasma (Bratisl)
12 no.2:119-124 '65

1. Institute of Experimental Biology and Genetics, Czechoslovak
Academy of Sciences, Prague, Czechoslovakia.

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Experiences in the exchange of defective lathes for repaired ones.
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KOLDOVSKY, P.; ADAMCOVA, Berta; BURENIK, J.

Relationship of radioresistance and immunoresistance in an experimental tumour. Folia biol. (Praha) 11 no.5:393-395 '65.

1. Institute of Experimental Biology and Genetics, Czechoslovak Academy of Sciences, Prague.

BUBENIK, V.

Some remarks on the construction of a new wincher. p. 182.
KRIDL VLASTI, Praha, No. 8, Apr. 1955.

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, no. 10, Oct. 1955,
Uncl.

621.372.5: 621.3.012.8
13074. A NEW METHOD OF SOLVING SERIES-PARALLEL
CIRCUITS. V. Batenik

Slaboproudy ~~Obzr.~~ No. 1, 19-28 (1956). In Czech.

A series-parallel circuit is defined as a two-mesh quadripole consisting of R, C and L elements. It is shown that very often the quadripole can be replaced (for the purpose of analysis) by an equivalent series RLC circuit whose parameters are functions of the original elements. The transformation is done by means of two simple tables which determine the parameters of an equivalent circuit. Several numerical examples are shown; in particular, the transient response of a RC amplifying stage is evaluated. The transient response of a series RLC circuit with various damping coefficients is evaluated, the output being derived from either the resistance, capacitance or the coil.

R.S. Sidorowicz